

What is claimed is:

1. A liquid crystal display unit comprising:

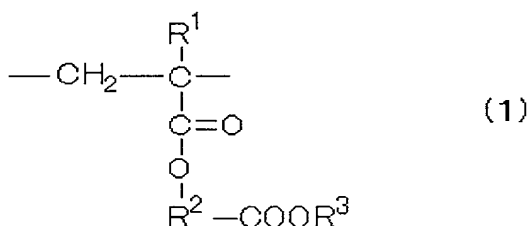
a TFT substrate with a thin film transistor (TFT) formed thereon;

5 an opposite substrate with a common electrode formed thereon; and

a liquid crystal layer packed and formed between these substrates, wherein said TFT substrate comprises a first transparent substrate, and a first light shielding film, an underlying film, a TFT, a first inter-layer film, a wiring  
10 metal film, a second inter-layer film, a third inter-layer film, a smoothening film, a first transparent electrode film and a first alignment layer sequentially formed on the first transparent substrate, said opposite substrate comprises a second transparent substrate, and a second transparent  
15 electrode and a second alignment layer sequentially formed on the second substrate, and said smoothening film is made of a transparent resin so as to pass light therethrough without absorbing light with a wavelength of 300 nm or higher

2. A liquid crystal display unit as set forth in claim 1, wherein said transparent resin is an acrylic resin.

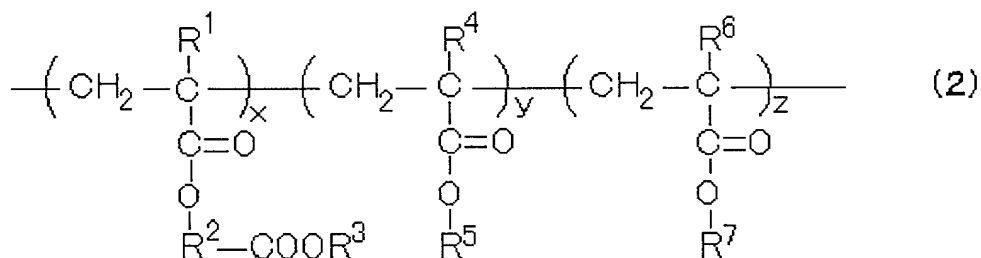
3. A liquid crystal display unit as set forth in claim 1, wherein said transparent resin is an acrylic resin, prepared from a polymer having a repetitive unit represented by the following formula (1).



5

where in the formula (1), R<sup>1</sup> represents either one of a hydrogen atom and a methyl group, R<sup>2</sup> represents an alkylene group with a bridged cyclic hydrocarbon group and R<sup>3</sup> represents either one of a hydrogen atom and an alkyl group.

4. A liquid crystal display unit as set forth in claim 1, wherein said transparent resin is an acrylic resin, prepared from a polymer having the repetitive unit represented by the following formula (2).



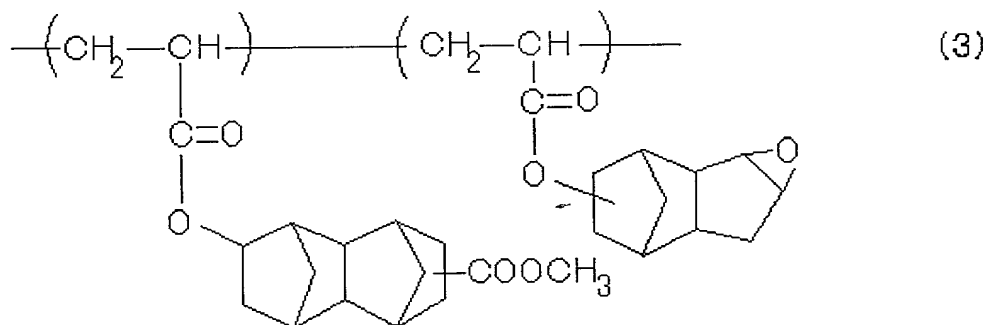
5

where in the formula (2), R<sup>1</sup>, R<sup>4</sup> and R<sup>6</sup> represent either one of a hydrogen atom and a methyl group, R<sup>2</sup> represents an alkylene group with a bridged cyclic hydrocarbon group, R<sup>3</sup> represents either one of a hydrogen atom and an alkyl group, R<sup>5</sup> represents an alkyl group with an epoxy group, and R<sup>7</sup> represents either one of a hydrogen atom and an alkyl group,

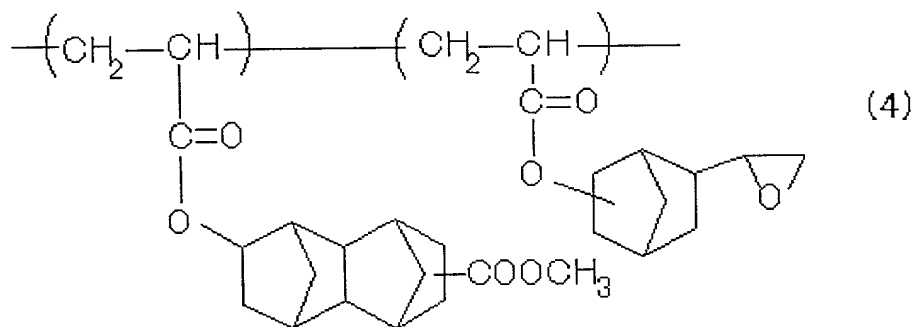
10

$x+y+z=1$ ,  $0 < x \leq 1$ ,  $0 \leq y < 1$ ,  $0 \leq z < 1$  and the polymerization average molecular weight of a polymer is 500 to 500,000.

5. A liquid crystal display unit as set forth in claim 1, wherein said transparent resin is an acrylic resin, prepared from acetoxy tetracyclo [4. 4. 0. 1<sup>2</sup>, 5. 1<sup>7</sup>, 1<sup>10</sup>] dodecyl acrylate-3, 4-epoxy tricyclo [5. 2. 1. 0<sup>2</sup>, 6] decyl acrylate represented by the following formula (3).



6. A liquid crystal display unit as set forth in claim 1, wherein said transparent resin is an acrylic resin, prepared from poly (acetoxy tetracyclo [4. 4. 0. 1<sup>2</sup>, 5. 1<sup>7</sup>, 1<sup>10</sup>] dodecyl acrylate-2-epoxy norbornyl acrylate represented by the following formula (4).



7. A liquid crystal display unit as set forth in claim 1, wherein said TFT substrate has a second light shielding film between said second inter-layer film and said third inter-layer film.

8. A method for manufacturing a liquid crystal display unit comprising:

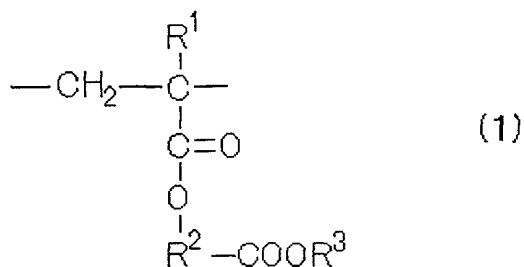
a TFT substrate with a thin film transistor (TFT) formed thereon;

5 an opposite substrate with a common electrode formed thereon; and

a liquid crystal layer packed and formed between these substrates, wherein said TFT substrate is prepared by forming sequentially a first light shielding film, an underlying film,  
10 a TFT, a first inter-layer film, a wiring metal film, a second inter-layer film, a third inter-layer film, a smoothening film, a first transparent electrode film and a first alignment layer on a first transparent substrate, said opposite substrate is prepared by forming sequentially a second  
15 transparent electrode and a second alignment layer on a second transparent substrate, and said smoothening film is made of a transparent resin so as to pass light therethrough without absorbing light with a wavelenght of 300 nm or higher.

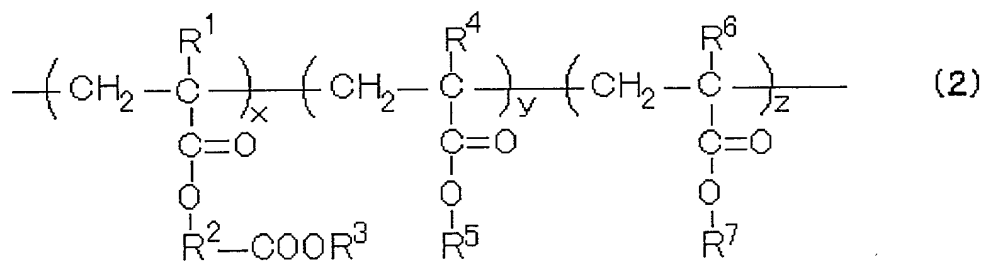
9. A method for manufacturing a liquid crystal display unit  
20 as set forth in claim 8, wherein said transparent resin is an acrylic resin.

10. A method for manufacturing a liquid crystal display unit as set forth in claim 8, wherein said transparent resin is an acrylic resin, formed by applying on said third inter-layer film a solution obtained by dissolving a polymer having  
5 the repetitive unit represented by the following formula (1) and a heat latent catalyst which generates an acid on heating in an organic solvent, and then by thermal polymerization.



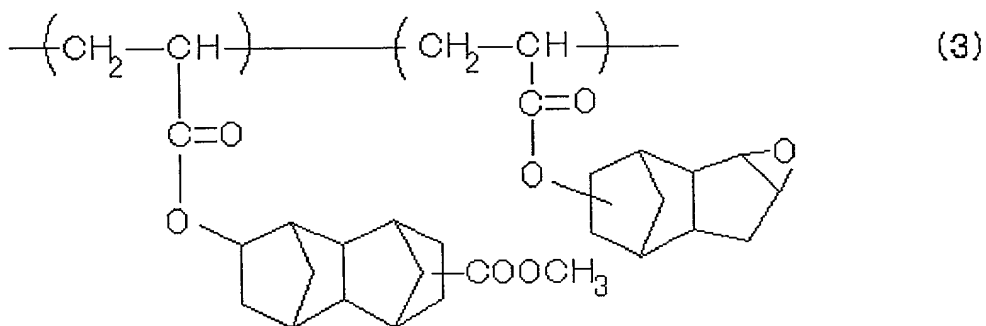
where in the formula (1), R<sup>1</sup> represents either one of  
10 a hydrogen atom and a methyl group, R<sup>2</sup> represents an alkylene group with a bridged cyclic hydrocarbon group, R<sup>3</sup> represents and either one of a hydrogen atom and an alkyl group.

11. A method for manufacturing a liquid crystal display unit as set forth in claim 8, wherein said transparent resin is an acrylic resin, formed by applying on said third inter-layer film a solution obtained by dissolving a polymer having  
5 the repetitive unit represented by the following formula (2) and a heat latent catalyst which generates an acid on heating in an organic solvent, and then by thermal polymerization.



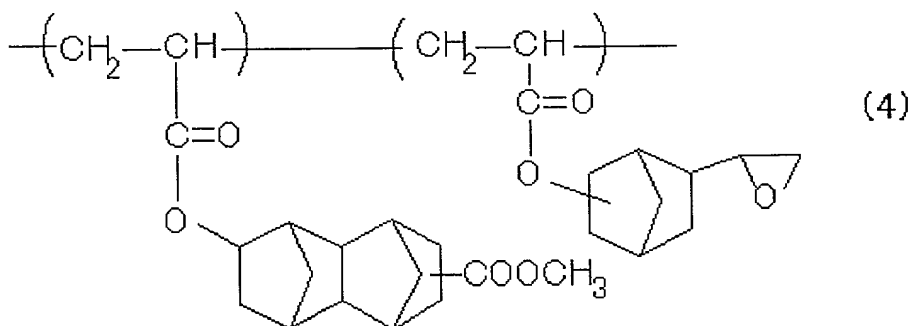
where in the formula (2), R<sup>1</sup>, R<sup>4</sup> and R<sup>6</sup> represent either one of a hydrogen atom and a methyl group, R<sup>2</sup> represents an alkylene group with a bridged cyclic hydrocarbon group, R<sup>3</sup> represents either one of a hydrogen atom and an alkyl group, R<sup>5</sup> represents an alkyl group with an epoxy group and either one of a hydrogen atom, and R<sup>7</sup> represents an alkyl group, x+y+z=1, 0<x≤1, 0≤y<1, 0≤z<1 and the polymerization average molecular weight of a polymer is 500 to 500,000.

12. A method for manufacturing a liquid crystal display unit as set forth in claim 8, wherein said transparent resin is an acrylic resin, formed by applying on said third inter-layer film a solution obtained by dissolving acetoxypoly[4.4.0.1<sup>2,5</sup>.1<sup>7,10</sup>] dodecyl acrylate-3,4-epoxytricyclo[5.2.1.0<sup>2,6</sup>] decyl acrylate represented by the following formula (3) and a heat latent catalyst which generates an acid on heating in an organic solvent, and then by thermal polymerization.

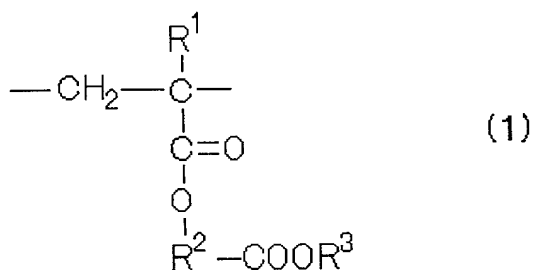


10

13. A method for manufacturing a liquid crystal display unit as set forth in claim 8, wherein said transparent resin is an acrylic resin, formed by applying on said third inter-layer film a solution obtained by dissolving poly (acetox-  
 5 y tetracyclo [4. 4. 0. 1<sup>2</sup>, 5. 1<sup>7</sup>, 1<sup>10</sup>] dodecyl acrylate-2-epoxy norbornyl acrylate represented by the following formula (4) and a heat latent catalyst which generates an acid on heating in an organic solvent, and then by thermal polymerization.



14. A method for manufacturing a liquid crystal display unit as set forth in claim 8, wherein said transparent resin is an acrylic resin, formed by applying on said third inter-layer film a solution obtained by dissolving a polymer having  
 5 the repetitive unit represented by the following formula (1) and one of the heat latent catalysts which generate an acid on heating, selected from 2-oxocyclo hexylmethyl (2-norbornyl) sulfonium trifluorate and cyclohexylmethyl (2-oxocyclohexyl) sulfonium trifluorate, in an organic solvent,  
 10 and then by thermal polymerization.

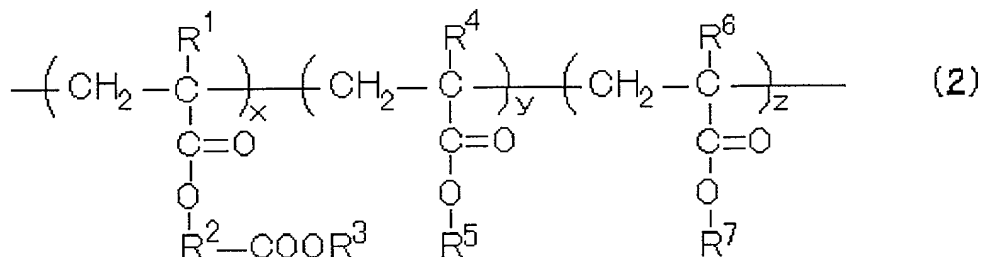


where in the formula (1), R<sup>1</sup> represents either one of a hydrogen atom and a methyl group, R<sup>2</sup> represents an alkylene group with a bridged cyclic hydrocarbon group, and R<sup>3</sup>  
 15 represents either one of a hydrogen atom and an alkyl group.

15. A method for manufacturing a liquid crystal display unit as set forth in claim 8, wherein said transparent resin is an acrylic resin, formed by applying on said third inter-layer film a solution obtained by dissolving a polymer having  
 5 the repetitive unit represented by the following formula (2) and one of the heat latent catalysts which generate an acid on heating, selected from 2-oxocyclo hexylmethyl (2-



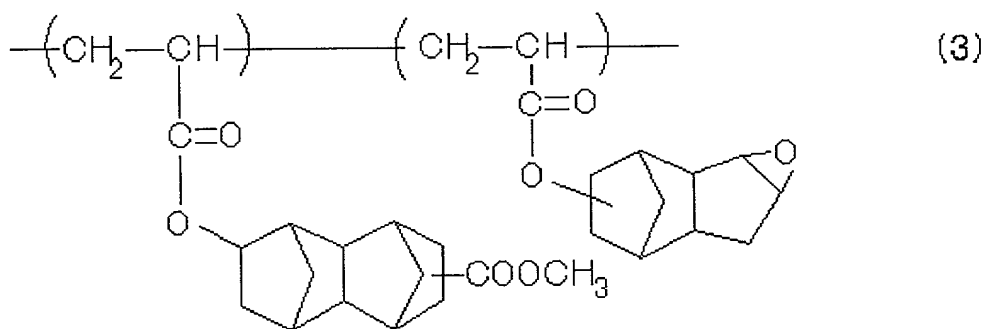
norbornyl) sulfonium trifluorate and cyclohexylmethyl (2-oxocyclohexyl) sulfonium trifluorate, in an organic solvent,  
10 and then by thermal polymerization.



where in the formula (2), R<sup>1</sup>, R<sup>4</sup> and R<sup>6</sup> represent either one of a hydrogen atom and a methyl group, R<sup>2</sup> represents an alkylene group with a bridged cyclic hydrocarbon group, R<sup>3</sup>  
15 represents either one of a hydrogen atom and an alkyl group, R<sup>5</sup> represents an alkyl group with an epoxy group, and R<sup>7</sup> represents either one of a hydrogen atom and an alkyl group, respectively, x+y+z=1, 0<x≤1, 0≤y<1, 0≤z<1 and the polymerization average molecular weight of a polymer is 500  
20 to 500,000.

16. A method for manufacturing a liquid crystal display unit as set forth in claim 8, wherein said transparent resin is an acrylic resin, formed by applying on said third inter-layer film a solution obtained by dissolving acetoxymethyl  
5 tetracyclo [4. 4. 0. 1<sup>2, 5</sup>. 1<sup>7, 10</sup>] dodecyl acrylate-3, 4-epoxy tricyclo [5. 2. 1. 0<sup>2, 6</sup>] decyl acrylate represented by the following formula (3) and one of the heat latent catalysts which generate an acid on heating, selected from 2-oxocyclo

hexylmethyl (2-norbornyl) sulfonium trifluorate and  
 10 cyclohexylmethyl (2-oxocyclohexyl) sulfonium trifluorate,  
 in an organic solvent, and then by thermal polymerization.



10



5